CLAIMS

What we claim is:

1. An apparatus adapted for microbial intervention and pasteurization of food having an outer surface, comprising:

a chamber having a bottom surface, and a suspension element adapted to support the food above the bottom surface;

a superheater for circulation heating to temperatures from about 65° C to about 232° C, having inlet and outlet connections and thermostat control;

a steam generator having a steam outlet pipe, and a water inlet valve, the steam outlet pipe being in fluid communication with the inlet of the superheater;

a controller operably connected to the water inlet valve, the steam generator and the superheater;

a timer operably connected to the controller and superheater;

a power source connected to the steam generator, the controller, the timer, and the superheater; and

a temperature sensor adapted to sense the temperature of the food or chamber where the food is exposed, the sensor being connected to the controller.

2. The apparatus of Claim 1, wherein the chamber includes a drain.

3. The apparatus of Claim 1, further including a chilled water source for bathing the produce.

4. The apparatus of Claim 1, wherein the steam generator includes a backflush pipe having a safety valve.

5. The apparatus of Claim 1, wherein the suspension element is a shelf.

6. The apparatus of Claim 5, wherein the shelf is a porous shelf.

7. The apparatus of Claim 1, wherein the suspension element is a conveyor.

8. The apparatus of Claim 7, wherein the conveyor is a porous conveyor.

9. The apparatus of Claim 1, wherein the controller and the timer form an integral unit.

10. The apparatus of Claim 1, wherein the temperature sensor is a thermocouple.

11. The apparatus of Claim 10, wherein the thermocouple is inserted into the steam pipe.

12. The apparatus of Claim 10, wherein the connection between the thermocouple and the controller is wireless.

13. The apparatus of Claim 1, wherein the temperature sensor is a remote electronic measuring device.

14. The apparatus of Claim 1, wherein the chilled water source is located inside the chamber.

15. The apparatus of Claim 1, wherein the chilled water source is located outside the chamber.

16. The apparatus of Claim 1, wherein the steam generator includes a first set of plates and a second set of plates electrically connected to the power source.

17. The apparatus of Claim 16, wherein the steam generator further includes an immersion heating element producing steam under pressure from about 30 pounds per square inch to about 100 pounds per square inch.

18. The apparatus of Claim 1, where the superheater includes a flanged immersion heater, vessel, insulation, terminal enclosures, inlet and outlet water sources and connections, and an integral thermostat.

19. The apparatus of Claim 1, wherein the water inlet valve is connected to an orifice.

20. A method for microbial intervention and pasteurization of food having an outer surface comprising the steps of:

placing the food in a chamber;

adding superheated steam to the chamber;

sensing a temperature of the food outer surface;

adding steam to the chamber if the measured temperature of the food outer surface is less than a preselected temperature, otherwise;

starting a timer having a timeout period;

adding steam to the chamber until the timeout period occurs; and

stopping the addition of steam to the chamber.

21. The method of claim 20, further including the step of bathing the outer surface of the food with chilled water.

22. The method of Claim 20, wherein the step of sensing a temperature of the food outer surface is accomplished using a thermocouple placed in proximity to the food outer surface.

23. The method of Claim 20, wherein the step of sensing a temperature of the steam within the steam outlet pipe is accomplished using a thermocouple placed within the steam outlet pipe.

24. A method for microbial intervention and pasteurization of food having an outer surface comprising the steps of:

placing the food in a chamber;

adding super heated steam of about 65° C to about 232° C to the chamber;

sensing a temperature of the steam inside the steam outlet pipe;

adding superheated steam to the chamber until the temperature of the food outer surface is greater than a first preselected temperature;

starting a timer having a timeout period; and

adding superheated steam to the chamber until the timeout period occurs, or the measured temperature of the food becomes greater than a second preselected temperature, whichever occurs first.

25. The method of claim 24, further including the step of bathing the outer surface of the food with chilled water after the timer reaches the timeout period.

26. The method of Claim 24, wherein the step of sensing a temperature of the food about 1/4 inch below the food outer surface is substituted for the step of sensing a temperature of the steam within the steam outlet pipe, and wherein the step of adding superheated steam to the chamber until the measured temperature of the food about 1/4 inch below the outer surface is greater than a first preselected temperature is substituted for the step of adding superheated steam to the chamber

until the temperature of the steam within the steam outlet pipe is greater than a first preselected temperature.

27. The method of Claim 24, wherein the step of sensing a temperature of the food outer surface is accomplished using a thermocouple placed in proximity to the steam in the steam outlet pipe.

28. The method of Claim 24, wherein the step of sensing a temperature of the steam in the steam outlet pipe is accomplished using a remote electronic sensing device.

29. An apparatus for microbial intervention and pasteurization of equipment having an outer surface, comprising:

a chamber having a bottom surface, and a suspension element for supporting the equipment above the bottom surface;

a superheater for circulation heating to temperatures from about 65° C to about 232° C, having inlet and outlet connections and thermostat control;

a steam generator having a steam outlet pipe and a water inlet valve, the steam outlet pipe being in fluid communication with the inlet of the superheater;

a controller operably connected to the water inlet valve, the steam generator, and the superheater;

a timer operably connected to the controller and superheater;

a power source connected to the steam generator, the controller, the timer, and the superheater; and

a temperature sensor adapted to sense the temperature of the equipment outer surface, the sensor being connected to the controller.

30. The apparatus of claim 29, further including a chilled water source.

31. A method for microbial intervention and pasteurization of equipment having an outer surface comprising the steps of:

placing the equipment in a chamber;

adding super heated steam of about 65° C to about 232° C to the chamber;

sensing a temperature of the equipment outer surface;

adding superheated steam to the chamber until the temperature of the equipment outer surface is greater than a first preselected temperature;

starting a timer having a timeout period; and

adding superheated steam to the chamber until the timeout period occurs, or the measured temperature of the equipment outer surface becomes greater than a second preselected temperature, whichever occurs first.

32. The method of claim 31, further including the step of bathing the outer surface of the equipment with chilled water after the timer reaches the timeout period.